

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorders Division

Washington, DC 20594

September 18, 2000

Air Traffic Control Recording

Sound Spectrum Study

Specialist's Report by

Anna W. Cushman

A. ACCIDENT

Location:	West Palm Beach, Florida
Date:	September 3, 1999
Time:	0325 eastern daylight time (EDT)*
Aircraft:	Beech B-90, N338AS
NTSB Number:	MIA99FA245

B. GROUP No Group.

C. SUMMARY

On September 3, 1999 a Beech B-90, N338AS, struck a building and crashed while on approach to Palm Beach International Airport in West Palm Beach, Florida. A re-recording of air traffic control transmissions was sent to the audio laboratory at the National Transportation Safety Board. A sound spectrum study was completed on the cassette tape to identify any background sound signatures that could be associated with the aircraft.

* All times are expressed in eastern daylight time (EDT), unless otherwise noted.

D. DETAILS OF INVESTIGATION

The sound spectrum study was completed on radio transmissions from the accident aircraft as follows (Table 1):

XMSN ID	SOURCE	TRANSCRIPT
1	N338AS	and ah West palm this ah November ah November ah...
2	N338AS	...November three three eight Alpha Sierra we'd like to land at ah Palm Beach if we can.
3	ATC	[Alpha Sierra descend and maintain one thousand five hundred. airport at ten to 11 o'clock 5 miles]
4	N338AS	Alpha Sierra roger we're landing with ***.
5	ATC	[airport in sight]
6	N338AS	affirmative.
7	ATC	[cleared visual approach one three. wind calm. cleared to land]
8	N338AS	roger cleared to land.
9	ATC	[traffic will remain east of runway one three]
10	N338AS	* Sierra roger.
11	N338AS	Alpha Sierra we need ah we got a MAYDAY Alpha Sierra... MAYDAY.

LEGEND	
N338AS	Accident Aircraft
ATC	West Palm Beach tower controller
[]	Editorial/Paraphrased comment
***	Unintelligible words

Table 1: Transmissions at West Palm Beach tower involving N338AS.

The entire recording was examined for aircraft noise. The only signatures present were voice – there were no signals evident that could be associated with the aircraft in any of N338AS's transmissions, except possibly in Transmission 4.

The signals present in Transmission 4 from 22.35 seconds to 22.65 seconds are shown in the voiceprint* below. The signals were at 2164 Hz, 2359 Hz, 2560 Hz, 2753 Hz, 2951 Hz, and 3146 Hz. If the signals were the components of a signature, they would correspond to the 11th, 12th, 13th, 14th, 15th and 16th harmonics of a 196.7 Hz fundamental frequency. There were also two signals present at 1000 Hz and 1500 Hz, but because they appeared between transmissions from N338AS and throughout the recording, they were not attributed to the accident aircraft.

Notably the only aural warning sources in the cockpit of N338AS were the gear warning horn with a frequency of 500 Hz, and the stall warning horn with a frequency of 1000Hz. Additionally, except at high pitch angles, propeller signature harmonics are not typically evident in the upper frequency range of the spectrum (above the 5th or 6th harmonic and 1500 Hz). Although the source of the signature was not determined, it did not appear to be either voice or a cockpit aural warning tone.

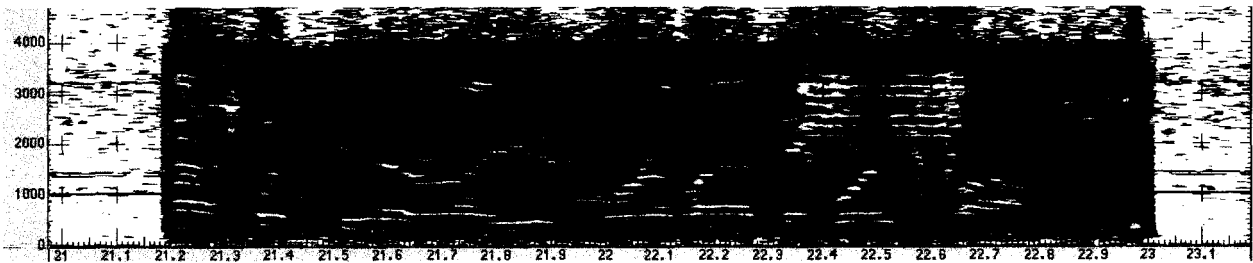
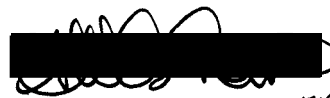


Figure: Voiceprint of Transmission 4 from N338AS.


 Anna W. Cushman
 Sound Spectrum Specialist

* Color on the voiceprint plots represents a relative magnitude of frequency strength – specifically, from low strength to high strength: white, blue, red, orange, yellow, and teal. The time shown in the voiceprints is a relative time (in seconds) and is not correlated to the accident time.